WORK ABILITY AND WORK-FAMILY CONFLICT AMONG A UNIVERSITY HOSPITAL HEALTHCARE WORKERS: THE EFFECT ON WORK-LIFE BALANCE

By

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Abstract

Introduction: The work environment of healthcare professionals is psychologically traumatic and extremely demanding. Excessive work stress can negatively impact their health and productivity. Achieving work-life balance (WLB) is crucial for the success of workers and organizations. **Aim of Work:** To assess work-family conflict (WFC) and the work ability index (WAI) among healthcare workers and to identify personal and work-related factors influencing their WLB. **Materials and Methods:** The current cross-sectional study was performed on 293 healthcare workers at Zagazig university hospitals using standardized questionnaires including sociodemographic characteristics and scales of WAI, WFC, and WLB. Results: The WAI among administrative workers was significantly higher than among nurses and healthcare professionals. About 33.0% of healthcare workers had a good WAI, with the percentage being higher among males, singles, and younger age. WFC was higher among females and increased with those having a higher number of children, and it was also significantly higher among healthcare professionals compared to nurses and administrative workers. It was found that administrative workers, singles, and highly educated individuals had a higher WLB. In addition, working hours were discovered to be significant predictors of the WAI, WFC, and WLB. A significant negative correlation was detected between WFC and both WLB and WAI. **Conclusions and Recommendations:** The potential to balance personal and professional obligations is a concern for both workers and organizations.

Employers would be able to better understand their situation and take action to improve working conditions if they monitored employee performance. Organizations must find methods to improve working conditions to become more effective and productive.

Introduction

Work is an integral part of life and can significantly affect a person's health and well-being. Work ability is defined as a person's potential to perform work-related tasks while taking their well-being, working conditions, and psychological resources into account (Ehmann et al., 2021).

Work ability aims to balance personal resources with employment demands and is the product of both the worker and the workplace (Abdelrehim et al., 2021). The Finnish Institute of Occupational Health (FIOH) developed the work ability index (WAI) questionnaire, the most widely used diagnostic tool of work ability (Tuomi et al., 1998).

Work and family obligations are not independent of one another. Family-related stress can lead to pressure at work, and vice versa, which can affect how well individuals perform their jobs (Yeh et al., 2021). The struggle of employees to integrate the competing demands of their home and work responsibilities has been broadly defined as Work-Family Conflict (WFC) (Shukri et al., 2021). WFC has two dimensions: the conflict between work and family responsibilities (WFC) and the conflict between family responsibilities and work obligations (FWC) (Frone et al., 1992).

Work-life balance (WLB) refers to the potential of workers to balance work and non-work activities (such as learning, community, and home) throughout their professional careers. WLB can be achieved through a variety of workstyles and lifestyles to create a well-balanced and fulfilling situation. WLB highlights the importance of both work-family and non-family issues in a person's personal life (Matsuo et al., 2021).

Healthcare is one of the world's biggest and most rapidly expanding industries in terms of revenue and employment. They can have irregular work schedules, night shifts, and other responsibilities that could affect their WLB (Rao and Shailashri, 2021).

A balance between personal life as well as work is required to alleviate

the tension between professional and domestic life. In the modern world, the inability to balance family and work obligations has become a significant source of stress for many. In recent decades, researchers have paid significantly more attention to this topic (Čikić and Rajačić, 2021; Şahin and Yozgat, 2021).

Aim of Work

To assess work-family conflict (WFC) and the work ability index (WAI) among healthcare workers and to identify personal and work-related factors influencing their work-life balance (WLB).

Materials and Methods

Study design: A cross-sectional study

Place and duration of the study: The present study was carried out among healthcare workers (healthcare professionals, nurses, and administratives according to the classification of CDC, 2016) at Zagazig university hospitals from June to September 2022. The study targeted healthcare workers attending the infection control unit for vaccination at the time of the investigation (COVID-19, Influenza, and Hepatitis B vaccines). Inclusion criteria included healthcare workers who had worked for at least one year and those who accepted to be enrolled in the study.

Sampling methods: The sample size was calculated utilizing the OpenEpi program, with the total number of healthcare workers being 6,272 (A previous study found that percentage of workers with optimal work ability was 27.5%) (Abdelrehim et al., 2021), and confidence limits of 5%, the calculated sample size was 293 participants . We used a systematic random sampling technique to select 30 healthcare workers/ week for participation in the study. The average number of workers attending the infection control unit for vaccination was 90 workers/ week. K interval was 3.

Validation and pilot study: Healthcare workers were subjected to standardized questionnaires that were suitably translated into Arabic and subsequently back-translated into English by another language expert. A group of experts evaluated the Arabic versions for content validity. A pilot study was performed on 30 workers to determine the validity of the study tools, and they were excluded from the study.

Study methods: Healthcare

workers were subjected to **standardized questionnaires** (self-administered) which covered the following:

I-Sociodemographic characteristics (e.g., marital status, gender, education, occupation, age, working hours, number of children, and work duration).

II- Perceived work ability, which was evaluated by the WAI questionnaire (Tuomi et al., 1998) which includes seven parts:

(1) Current work ability relative to the best lifetime (scores 0-10, 0 means cannot work at all, 10 work ability at its best).

(2) Current subjective work ability concerning the mental and physical work requirements (two questions, both on a 5-point scale, 1=very poor 5=very good).

(3) Disease number diagnosed by a physician (seven points scale, 5 or more diseases = 1 point, 4 diseases = 2 points, 3 diseases= 3 points, 2 diseases = 4 points, 1 disease = 5 points, no disease = 7 points).

(4) Measured work impairment resulting from illnesses (six points scale, 1= entirely unable to work, 6= no hindrance / no diseases).

(5) Sick leave in the last 12 months (scores were 1=100 days or more, 2= 25 - 99 days, 3=10 - 24 days, 4= Max. 9 days, 5= 0 days).

(6) Personal Work ability prognosis in the upcoming two years (a score of 7= Relatively certain; 4= Not Certain; 1= Unlikely able to work).

(7) Personal resources (mental capacities) in the last three months evaluated by three questions (feeling fully hopeful about the future, being alert and active, and enjoying everyday activities). The responses varied between Often=4, Rather often=3, Sometimes=2, Rather seldom=1, Never=0

Work ability is classified into four classifications based on the WAI score: Excellent (44-49), Good (37-43), Moderate (28-36), and Poor (7-27).

III- **WFC and FWC Scale** (Netemeyer et al., 1996; Haslam et al., 2015). This scale provides a dual-directional evaluation of the conflict between the WFC and the FWC.

Five questions are on the WFC, and the other five are on the FWC.

Answers are on 7 points Likert scale (Very Strongly Agree, Strongly Agree, Agree, Neither Agree Nor disagree,

Disagree, Strongly Disagree, and Very Strongly Disagree). The scale was calculated by summing all the 1 to 7 responses for the five questions of WFC to give a scale ranging from 7 to 35 and the same for the five questions of FWC to give a scale that ranges between 7 and 35. Higher scores denote increased conflict levels.

IV- WLB scale (Hayman, 2005). It includes 15 items in order to evaluate the three WLB domains: work/personal life enhancement (WPLE-4 items), personal life interference with work (PLIW-4 items), and work interference with personal life (WIPL-7 items).

Answers are on 5 points Likert scale (Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, and Strongly Disagree). Questions seven to 11 have reversed scores. The overall WLB score is determined by the addition of three dimension scores. Higher scores indicate better WLB.

Consent

All participants provided informed consent, information confidentiality was guaranteed, and the findings would be utilized for research purposes. Subjects were informed that they could decline participation and withdraw at any time without explanation.

Ethical Approval

Prior to the study's onset, the protocol was approved by the Institutional Review Board and the Ethical Committee of Zagazig University (IRB#9553). The administrative manager of Zagazig University Hospital obtained official permission to conduct the study. This study was conducted in adherence to the Declaration of Helsinki.

Data Management

Data collection, entry, and analysis were done utilizing the 24.0 version of the SPSS software. Qualitative variables were expressed as percentages and numbers, whereas quantitative variables were as mean ± SD. Association significance was tested utilizing the student t-test (compares means for two groups), ANOVA test (compares several means), and Post Hoc (LSD) test (that determines which means differ) for continuous variables. In addition, Pearson correlation was utilized for measuring the linear correlation between data. Linear regression analysis was used to define the most significant predictors. The level of statistical significance was set to p-value<0.05.

Results

Table (1): Characteristics of the studied healthcare workers

Characteristics	Frequency (%)
Age/years	Range 25-59
	X±SD 40.2±8.7
Gender:	
Male	114 (38.9)
Female	179 (61.1)
Education:	
Nursing school	68 (23.2)
Bachelor's degree	66(22.5)
Postgraduate	159(54.3)
Occupation:	
Healthcare professionals	171 (58.3)
Nurses	107(36.5)
Administrative	15(5.1)
Marital status:	48(16.4)
Single	209(71.3)
Married	15(5.1)
Divorced	21(7.2)
Widow	
Healthcare workers having children	227(77.5)
Number of children	Range 0-8
	X±SD 2.1±1.5
Working hours/day	Range 4-24
	X±SD 8.7±4.5
Working years	Range 1-40
	X±SD 17.9±10.3

Table (1) showed that the studied healthcare workers had a mean age of 40, ranging from 25 to 59 years old. Sixty-one percent of them are females, and more than half of them have postgraduate education. More than 70% of them were married and had children (71.3%, 77.5%). The mean number of working hours was 8.7 hours per day, ranging from 4 to 24 hours per day, while the mean number of working years was 18 years, ranging from 1 year to 40 years.

Table (2): Mean scores of Work Ability Index, Work Family Conflict subscales, and Work Life Balance .

Variables	Mean	SD
Work ability score	41.1	6.0
Work ability classes Poor Moderate Good Excellent	N (%) 6(2.0) 107(36.5) 96(32.8) 84(28.7)	
The work-to-family conflict subscale	22.7	6.9
The family-to-work conflict subscale	17.0	6.1
Overall work-life balance score	46.8	5.1
Work Interference with Personal Life	20.8	5.4
Personal Life Interference with Work	13.9	2.8
Work Personal Life Enhancement	12.1	2.9

Table (2) showed that 36.5% and 32.8% of studied healthcare workers had Moderate and Good WAI. The mean score for work ability was 41.1±6.0. The mean scores for the WFC and the FWC were 22.7±6.9 and 17.0±6.1. The overall WLB score was 46.8±5.1.

Table (3): Relation between sample characteristics and Work Life Balance, work ability, and Work Family Conflict subscales .

Variables		Work-life balance	Work ability	Work-to-family conflict	Family-to-work conflict
Age¥		r= -0.3 **p=0.000***	r= -0.15 **p=0.01***	r= 0.13 **p=0.03***	r=0.03 p= 0.6
Gender¥¥	Male Female	X±SD 47.4±4.3 46.5±5.6	X±SD 43.2±6.6. 39.7±5.1	X±SD 21.5±6.5 24.7±6.9	X±SD 16.2±6.2 17.4±6.1
	P-value	0.14	**0.000***	**0.000***	0.09
Education ¥¥¥	Nursing school Bachelor's degree Postgraduate	45.3±4.9 46.7±5.8 47.5±4.8	37.1±3.3 41.3±4.6 42.7±6.6	21.5±∘,∧ 20.1±7.2 24.3±6.7	19.8±7.1 14.8±5.1 16.6±5.6
	P-value	**0.01* P1=0.003*#**	**0.000* P2=0.000*# P3=0.000*#**	**0.000* P4=0.004*# P5=0.000*#**	**0.000* P6=0.000*# P7=0.000*# P8=0.04*#**
Occupation ¥¥¥	Healthcare professionals Nurses Administrative	48.1±4.5 46.1±4.8 53.0±5.6	40.3±5.1 39.2±4.6 42.1±5.9	25.5±3.4 24.2±7.2 21.3±5.5	16.0±5.8 18.3±6.5 17.2±4.3
	P-value	**0.000* P9=0.000*# P10=0.000*# P11=000*#**	**0.000* P12=0.02#***	**0.000* P13=0.04#* P14=0.000#***	**0.003# *** P15=0.02
Marital status ¥¥¥	Single Married Divorced Widow	50.5±4.1 45.6±6.0 47.1±5.0 44.0±3.2	42.6±6.1 41.3±6.0 35.5±5.0 39.1±3.1	22.3±7.6 22.9±7.0 24.6±5.3 20.6±3.7	16.6±5.3 16.9±6.24 19.8. ±7.8 16.0±5.7
	P-value	**0.001* P16= 0.002*# P17= 0.014*# P18= 0.007*# P19=0.000*#**	**0.000* P20= 0.000*# P21=0.02*# P22=0.000*#**	0.32	0.27
Children number¥		r=-0.07 p=0.2	r=-0.08 p=0.1	r= 0.16 **p=0.008***	r= 0.01 p=0.9
Working hours/day ¥		r=-0.17 **p=0.004***	r=-0.06 p=0.3	r= 0.29 **p=0.000***	r= 0.12 **p=0.04***
Working years¥		r=-0.3 **p=0.000***	r=-0.15 **p=0.01***	r= 0.14 **p=0.02***	r= 0.09 p=0.12

¥:Pearson correlation was used   ¥¥ :t-test was used   ¥¥¥: Anova test was used   #:Post Hoc (LSD) test was used.
* :Statistically significant

P1 is the p value between nursing school education and postgraduate education. P2 is the p value between nursing school education and Bachelor's degree education. P3 is the p value between nursing school education and postgraduate education. P4 is the p value between nursing school education and postgraduate education. P5 is .the p value between Bachelor's degree education and postgraduate education

P6 is the p value between nursing school education and Bachelor's degree education. P7 is the p value between nursing school education and postgraduate education. P8 is the p value between Bachelor's degree education and postgraduate education. P9 is the p value between healthcare professionals and nurses. P10 is the p value between healthcare professionals and administrative groups. P11 is the p value between nurses and administrative groups. P12 is the p value between nurses and administrative groups. P13 is the p value between healthcare professionals and nurses. P14 between healthcare professionals and administrative groups. P15 is the .p value between healthcare professionals and nurses

P16 is the p value between single and divorced groups. P17 is the p value between married and divorced groups. P18 is the p value between married and widow groups. P19 is the p value between divorced and widow groups. P20 is the p value between Single and divorced groups. P21 is the p value between Single and widow groups. .P22 is the p value between married and divorced groups

According to Table (3), there was a substantial correlation between the WAI and age (WAI was higher among younger ages) and for gender (WAI mean score for

males was more than that for females). Furthermore, the association between work ability and education was statistically significant (WAI mean score for workers with nursing school education was significantly less than those with Bachelor's degrees and postgraduate education). Regarding the relation between work ability and occupation, the mean score of WAI among administrative workers was substantially elevated than that of nurses and healthcare professionals). Concerning the relation between work ability and marital status, the WAI score for the single was significantly higher than scores for divorced and widow groups. Furthermore, a substantial negative correlation was detected between working years and work ability.

There was a significant association between WFC mean score and gender (females had more conflict than males). Additionally, WFC means the score was significantly higher for workers having postgraduate education than workers having Bachelor's degrees and nursing school education. The WFC mean score of healthcare professionals was significantly higher than nurses and administrative workers. Moreover, a significant positive correlation existed between WFC and working years, age, working hours, and number of children. In contrast, FWC mean score was significantly higher among workers with nursing education than those with Bachelor's degrees and Postgraduate education. While FWC means score for nurses was significantly higher than scores for health care professionals, with a significant positive correlation between FWC and the number of working hours.

A significant association was detected between WLB and education as WLB mean

score for workers with postgraduate education was significantly higher than for workers with nursing school. The same was noticed for occupation, as the WLB mean score for administrative workers was higher than for healthcare professionals and nurses. On studying the relationship between WLB and marital status, the WLB mean score for the single was higher than other classes. Furthermore, a significant negative correlation was demonstrated between WLB and age, working hours, and working years.

Table (4): Correlation between Work Life Balance, work ability, and Work Family Conflict subscales.

	Work-life balance (WLB)		Work ability		Work-to-family conflict (WFC)		Family-to-work conflict(FWC)	
	r	p	r	p	r	p	r	p
Work ability	0.04	0.4	-	-	-0.3	**0.000***	-0.4	**0.000***
Work-to-family conflict	-0.4	**0.000***	-0.23	**0.000***	-	-	0.4	**0.000***
Family-to-work conflict	-0.1	0.07	-0.4	**0.000***	0.4	**0.000***	-	-
Work-life balance	-	-	0.04	0.4	-0.4	**0.000***	-0.01	0.07

* :Statistically significant

Table (4) showed a significant negative correlation between WFC subscales and work ability. In addition, a significant negative correlation was detected between WLB and the WFC scale. In contrast, there was a significant positive correlation between WFC and FWC.

Table (5): Linear regression analysis showing the most important predictors of work ability, Work Life Balance , Work Family Conflict subscales

	Work-life balance (WLB) Standardized Beta(P)	Work ability Standardized Beta(P)	Work-to-family conflict(WFC) Standardized Beta(P)	Family-to-work conflict(FWC) Standardized Beta(P)
Age	0.19 (0.3)	-	0.65 (0.52)	-
Gender	-	**.54 (0.001)***	**0.16 (0.01)***	-
Marital status	**0.15 (0.04)***	.11 (0.07)	-	-
Education	0.016 (0.8)	0.16 (0.09)	0.09 (0.18)	0.14 (0.22)
Occupation	0.03 (0.77)	0.09 (0.17)	0.03 (0.6)	0.03 (0.6)
Children number	-	-	**0.25 (0.02)***	-
Working hours/day	**0.124(0.043)***	-	**0.27 (0.000)***	**0.15 (0.04)***
Working years	**0.47 (0.02)***	0.33 (0.08)	0.12 (0.5)	-

* :Statistically significant

was the male gender, and for WLB were marital status, working hours, and working years. Working hours was the most important predictor for FWC, while female gender and having more children were the most important predictors for WFC.

Discussion

Changes in demographic characteristics, particularly increased life expectations of the population worldwide and in the Arab countries, resulted in a rising mean age of the workforce. Consequently, the number of workers suffering from health complaints is growing, leading to decreased work ability (Kühn et al., 2018). Physical, mental, and emotional stress significantly affects most healthcare workers, negatively affecting their performance, efficiency, ability to do their jobs, and quality of life (Koinis et al., 2015; Mehrdad et al., 2016). Therefore, assessing, sustaining, and promoting employability is crucial for current and future healthcare providers. The present study aimed to assess factors associated with work ability, the conflict between work and family, and how these constructs affect WLB.

The mean age of our healthcare workers participants was 40 years old and the majority were females. The healthcare professionals represented more than half of the participants. More than 70% of the healthcare workers were married and had children. The mean number of working hours was 8.7 hours per day, while the mean number of working years was 18 years (Table 1).

The mean score of work ability among the studied group was 41(SD=6.0). Healthcare workers with moderate work ability exceeded one-third of the studied sample (36.5%) (Table 2). Similarly, Mehrdad et al. (2016) mean perceived work ability was 40.3 (±5.2), 21.1% categorized as moderate work ability.

Also there was a relatively significant correlation among the studied group for the profession variables. WAI mean scores among administrative workers were significantly higher than those for nurses and healthcare professionals (Table 3). The same association was reported by La Torri et al. (2021) from Italy, who revealed that the administrative staff and physicians had high WAI scores, while lower scores were detected in the category of nurses. Nurses showed good work ability, averaging 39.2±4.6 (Table 3), which was in line with a study performed in Taiwan by Chiu et al. 2007 who found that the mean WAI score among nurses was 38.4±4.4.

In addition, significant correlations were detected between WAI and education, marital status, and gender (Table 4). In contrast, Amirmahani

et al. (2022) from Iran failed to find significant correlation between WAI and both of age and educational level.

The present study showed a substantial negative correlation between WAI and both age and working years (Table 4), which was in accordance with several studies which reported a significant negative correlation between WAI and age (Magnago et al., 2012; Carel et al., 2013; Abbasi et al., 2016; Rostamabadi et al., 2017).

There was a significant association between WFC mean score and gender (females having more conflict than males) among the studied group (Table 4). This finding aligns with previous studies that reported female physicians with elevated WFC levels (Adam, 2009; Dumelow et al., 2010). Warde et al. (1996) from USA; highlighted that among physicians, females rather than males and younger rather than older female physicians had higher role conflict levels. Conversely, a study done by Innstrand et al. (2010) in Norway observed no difference between male and female HCWs regarding WFC. Although some researchers verified that women are experiencing higher levels of WFC, many studies reported the contrary (Hill, 2005; Yavas et al., 2008).

There was a significant positive correlation between WFC and age, number of children, working hours, and working years among the studied group (Table 4). This finding was contradicted with those of Labrague et al. (2021) from Philippines, who detected a negative correlation between WFC and age, while the FWC was unaffected by healthcare workers' age. In addition, they found a positive correlation between having children and FWC scores.

Also, a positive correlation between WFC and FWC was also found among the studied group (Table 4); the family-work conflict (FWC) increases as the WFC increases. La Torri et al. (2021) found similar correlations in their study.

WLB is achieving a state of individual stability by performing well through two entirely different roles, family and work roles, which satisfies the role holder (Shaffer et al. 2016). In line with Soomro et al. (2018) results from pakistan, the current analysis revealed a significant negative correlation between work-life balance and the WFC scale (Table 4). As WFC increases, work-life balance decreases. Furthermore, Rini et al. (2020) illustrated that conflicts (family interfering with work as well

as work interfering with family) negatively affect WLB. Meanwhile, in the same study the correlation between work-life balance and work interfering with family was significant.

Achieving a state of WLB has beneficial work consequences, whether by improving work ability or enhancing work outcomes like job satisfaction, organizational commitment, and work productivity. A positive correlation was detected between WLB and work ability; however, it was non-significant (Table 4). In harmony with our results, Johari et al. (2016) and Soomro et al. (2018), as well as Vernia and Senen (2021), revealed that WLB had a positive impact on workers' performance. A significant negative correlation between work ability and WFC was detected among the studied group (Table 4), which was similar to the results of Mohsin and Zahid's (2012) study from Pakistan, which demonstrated a substantial negative correlation between performance and FWC.

Regression analysis revealed that the most significant predictor of work ability was the male gender. It was working hours per day for FWC, while female gender and number of children were the most important predictors for WFC (Table 5). Abdelrehim et al. (2021) underlined the determinants of work ability among healthcare workers in Egypt. They found that the male gender, old age (≥ 40 years), and professional category of the physician are the main predictors of work ability. Lakshmi et al. (2012) from India and Tremblay and Ilama (2015) from Quebic, Canada, found that marital status, working hours, and working years were predictors of WLB. Meanwhile, Uzoigwe et al. (2016) from Nigeria; highlighted that work hours, family responsibilities, and work role overload are significant predictors of work-family role conflict.

Conclusion

One third of our sample had moderate work ability. An increase in WFC decreases both the work ability and the work life balance in healthcare workers. Females with large number of children and increased working hours had a higher WFC and a lower work life balance. Having higher educational level increases the responsibilities which causes more WFC and decreases the work life balance.

Recommendations:

In order to achieve a state of WLB,

targeted interventions are required to alleviate WFC as well as to enhance work ability. Interventions can include more flexible work schedules, effective health promotion programs and sturdy health insurance that enables worker to manage their health problems. In order to reduce conflict and achieve balance between the two main domains of personal life, we recommend targeted interventions such as providing child and elderly care programs to healthcare workers families.

Conflicts of interest

No conflict of interest to disclose.

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